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Finance, Investment and Macroeconomic Performance

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by  
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**Abstract:**

*Finance, power and distribution are issues that are largely absent in conventional macroeconomics. This paper outlines the implicit economic process embedded in the neo-classical and new-Keynesian constructions of macroeconomics regarding the finance-investment relation. It then develops a general post-Keynesian framework and argues that finance, power and income distribution are significant determinants of investment and macroeconomic activity.*

**Keywords:** *Finance, Income Distribution, Investment, Macroeconomic Activity*

**JEL Classification:** B22, D33, E12

## 1. Introduction

Inadequate long-term productive investment to support full employment and economic growth has been one of the most significant characteristics of many economies since the late 1970's. In addition, high unemployment, severe distributional changes, stagnation, financial turbulence and an increasing risk of deflation and crisis reinforce voices that traditionally dispute the fundamental ethical standard of efficiency through which political economy evaluates the capitalist system. A question that deserves analysis is to what extent the weak investment performance is related to financial developments and high interest rates, which are also symptoms of the economic instability in the post Bretton-Wood era.

The aim of this paper is to investigate the links between finance, monetary policy and investment and to enlighten the extent that poor investment performance could be attributed to monetary and financial factors. In section 2 we briefly and critically present the neo-classical and the new-Keynesian perspectives of the finance-investment relation, which consider investment conditional to changes in the cost of capital and to credit rationing. In section 3, we outline a general post-Keynesian perspective emphasising the importance of interest payments and firms' internal finance in investment decisions. In this perspective, power, financial interests and deflationary monetary policy merit serious

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responsibility for today's poor investment performance and macroeconomic instability. In section 4 we use econometric techniques to test some of our hypotheses, using annual data of the USA and the UK for the period 1970-2002. Finally, section 5 summarise and concludes the paper.

## **2. Finance and Investment in Alternative Macroeconomic Traditions**

The possibility that monetary and financial forces might influence investment and the performance of a capitalist economy has been frequently discussed and continues to be an issue of research in economic literature. Research interest on finance and investment has been motivated by the following three significant reasons: i) a consideration of money and finance as factors that might affect investment and economic activity gives rise to more general questions about the relationship between the monetary sector and the "real sector", a theme that has dichotomise economic theory; ii) investment affects the state of aggregate demand, and through it the output produced and employment. In the long-run, capital investment is a significant determinant of labour productivity, wage income and economic prosperity; iii) investment provides the means by which monetary policy might influence the course of business cycle in the short-run. To the extent that monetary policy influences investment, it will affect the capital stock and economic growth in the long-run. Bearing in mind the objective of many countries to improve their investment and economic performance, we need a clear conception of the mechanism with which finance and monetary policy might affect investment.<sup>1</sup>

### **2.1. The Neo-classical Macro Process**

Neo-classical macroeconomic research presumes that financial markets function smoothly and firms' investment decisions are isolated from financial influences. Modigliani and Miller (1958), who worked within the Arrow-Debreu economic environment, developed a theorem with which they assume that firms' investment decisions are independent from their financial structure under the assumption of perfect capital markets. The Modigliani and Miller theorem stimulated the development of the cost of capital perspective of investment decisions (Hall and Jorgenson, 1967; Jorgenson, 1971).

Neoclassical theoretical and empirical models of investment are heavily based on the assumption of a 'representative firm' that responds to prices set in self-equilibrated and perfectly competitive capital markets. If all firms have equal access to capital markets, then their financial structure is irrelevant to their productive investment, because, as Fazzari et al. (1988) have noted, external funds appear to be a perfect substitute for internal capital. With perfect capital markets, firms' investment decisions and their profit optimisation problem could be solved without considering effects of financial factors.

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<sup>1</sup> For extensive review papers on the finance-investment relation, see Jorgenson (1971), Gertler (1988) and Chirinko (1993).

Neoclassical monetary theory falls within the tradition of what Schumpeter (1954) termed 'real' analysis. Representative firms are considered to be rational units that make optimal decisions, i.e. employ the quantity of labour and capital, which maximise their profits and define their production possibilities. The only constraints on firm's decisions arise from market prices (which they cannot be affected by firms under the assumption of perfectly competitive markets) and technology (that determines the amount of output a firm can produce from given inputs and at a given price).

The neo-classical macroeconomic process is marked by a strong causation running from labour markets to good markets and in turn to financial markets. The economic rationale of this paradigm is as follows (Garegnani, 1978, Nuti, 1971). The perfectly competitive labour market determines employment and real wages. Labour demand depends upon the existing capital stock and production technology, which determines labour productivity. Labour supply depends on household income and preferences over leisure. Investment decisions are affected by the state of technology and technological progress as well as the market prices, including the interest rate, which determine the cost of capital. Given the level of employment and capital, firms' production technology determines output.

Given the level of output, interest rate adjustments clear the financial and product markets. The interest rate is viewed as being determined by 'real' factors in the long-run, which are usually summarized under the headings of productivity and thrift. These 'real' factors presumably lie behind the demand for, and the supply of, loanable funds. The interest rates equilibrate the demand for real loan used for financing consumption and investment with the supply of saving, validating Say's Law. Monetary policy affects investment only to the extent that it influences the market interest rate in the short-run. Money influences only the price level. Financial market equilibrium is achieved by the price level adjustment, which equilibrates the demand for and supply of real money balances. There are no feedback effects among markets.

The neo-classical link between finance, monetary forces and investment lies on the assumptions of rationality, perfect information and perfect competition. Under these assumptions and without financial and information constraints, money and finance do not matter for the well functioning of markets. For example, all firms can purchase all the productive factors they want, labour and capital, and sell all their output that maximises their profit at given prices. In the case that firms do not have sufficient profits (internal funds) to finance their investment projects, they can borrow all the funds they need externally, from the credit market. There is not any thrift of time inconsistency in credit market, which could interrupt the exchange process. Uncertainty and risk do not exist. Power and income distribution are absent. Labour markets are characterised by perfect competition, which means that both labour and firms have no power. If workers are given power through trade unions, there is not any change in the good and financial markets. Powerful unions give rise to higher wages and lower output and employment. All households have the same marginal propensity to consume, independent of their level of income, and hence the distribution of income between profits and wages does not matter.

Concluding, the perfectly competitive environment and the absence of any type of financial constraints described by the neoclassical perspective do not

adequately analyse the economic and financial conditions that firms and in general the industrial sector face in all economies. In real world, industrial firms have some control over the price they charge in product markets, while financial institutions and banks have control over the price and the availability of finance. The use of this set of assumptions and of the analytical apparatus of permanently self-equilibrated markets ensures internal stability in any market and in the whole economy. However, the assumptions of perfect capital markets and financially unconstrained firms are by no means undisputed. It is doubted to what extent they reflect economic reality and in particular the functioning of credit markets. The weak empirical success of the neoclassical theory of investment (Chirinko, 1993; Fazzari 1993; Fazzari and Mott, 1986-87; Fazzari et al., 1988) gives rise to uncertainty about the effectiveness of policies that have implemented on the basis of the neoclassical channel of influence on investment.

## **2.2. The New-Keynesian Macro Process**

New theoretical and empirical research has made important advances in studying what are often called external financial constraints. The idea that the access to finance may pose a constraint on investment, independent of traditional determinants such as interest rates, taxes, and technology, goes back at last to Marshall (1924), Fisher (1933) and Keynes (1937a; 1937b).

New-Keynesian economists have worked out sophisticated models in an attempt to construct the micro foundations of the effects of external finance failures in investment decisions. In these models, credit rationing is the result of the existence of uncertainty (Greenwald and Stiglitz, 1987; 1988). In a market economy, uncertainty, conditional to human inability to eliminate it in the context of probability, arises due to informational asymmetries among the participants in the markets. Despite the assumption made in these models that economic agents are rational and have perfect knowledge and computational capacity to elaborate the available information, they cannot form perfect expectations in order to make accurate predictions about changes in market prices, due to the fact that they do not have perfect information. The price mechanism does not operate efficiently to clear the markets, not because of institutional rigidities, but due to informational asymmetries (Greenwald and Stiglitz, 1989)<sup>2</sup>.

More specifically, new-Keynesian models consider how imperfect information between two traders can cause a malfunction within the capital market. An early example in this tradition is the paper written by Jaffee and Russell (1976), who explain credit rationing because of imperfect information on a borrower's quality. Lenders do not have perfect information about the quality of

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<sup>2</sup> *The informational asymmetries and imperfect markets are two of the basic differences between the new-Keynesian tradition and the new-classical tradition. New-classical models assume that economic agents are rational and have perfect information and perfect knowledge. Under these assumptions the price mechanism can operate efficiently and clears the markets, because economic agents can accurately predict changes in prices in the future. However, the relaxing of the assumption of perfect information generates market imperfections. In the neo-classical tradition market imperfections result from institutional rigidities in markets.*

the borrower and therefore, they cannot estimate the default probabilities among different borrowers. Since borrowers are indistinguishable, lenders charge a higher rate of interest, which incorporate a lemon's premium. Jaffee and Russell (1976) observed that the high rate of interest harms the economic interest of the good quality borrowers. In their view, credit-rationing results when good borrowers prefer the loan restrictions because the smaller loan sizes may reduce the market average default probability reducing the lemon's premium and the rate of interest. An interesting point in their work is that borrowers and lenders appear to have power to change the rate of interest.

Greenwald, Stiglitz and Weiss have developed various models of credit rationing. Starting with an initial allocation of information, the main assumption made is that banks select the rate of interest, which maximises their profits regardless of whether this rate of interest is the equilibrium rate (Stiglitz and Weiss, 1981). It is assumed that at this level of interest, the demand for credit is very likely to be greater than the supply of credit. This excess demand results not because of a change in the rate of interest, but due to credit rationing from banks. The rationale behind this assertion is that, there are loan applicants who appear to be identical with them who have received a loan, but they have been rejected unless they offered to pay a higher interest rate (Stiglitz and Weiss, 1981; Stiglitz, 1988; 1992). This happens due to the fact that there are moral hazard and adverse selection problems in the decision-making of the banking sector. The adverse selection problem is related to the existence of various borrowers who have different probabilities of repaying their loan. The profits of banks depend on the probability of repayment, so that banks wish to identify borrowers who are more likely to repay and to make optimal decisions, which maximise their profits in an uncertain environment (Greenwald and Stiglitz, 1993). The borrowers who are willing to pay high interest rate may on average have a higher probability of default, something that increases the risk of repayment for banks. Thus, a rise in the rate of interest will increase the average probability of default of those who have borrowed money, increasing the risk of the banks to make loss. Consequently, the rate of interest is considered to be a screening device among risk borrowers. The reason is that, informational asymmetries and moral hazard problems make banks unable to control the economic actions of the borrowers. Thus the banking sector selects the rate of interest, which maximises the profit of the sector unless it causes credit rationing. Blinder (1987) observes that credit rationing is the operative mechanism, which transmits any monetary shock to the product and labour market.

The question emerges is about the way with which credit rationing affects the product and labour markets and economic activity. When firms expect to make profits, they increase their demand for credit from the banking system to finance new investment. Initially banks accommodate the increasing demand for credit and supply the necessary credit to meet the demand. As long as economic activity expands, credit expansion fuels because of a credit multiplier, which leads to more investment in the business sector, more output and employment, as well as, more bank deposits and credit. The expansion of the economic activity is an inflationary process. As prices rise, the real available credit falls. Firms increase their demand for credit, which, however, cannot be met because of banks' policy to ration credit. In such a case, the business sector finds itself with limited external

financial resources and unable to undertake new investment. A fall in investment will reduce the aggregate demand and the expected business profits making the investors unwilling to borrow money. In this manner credit rationing causes a failure of aggregate supply and employment.

Myers and Majluf (1984), Greenwald, Stiglitz and Weiss (1984) and Stiglitz (1992) have developed equity rationing models analogous to credit rationing models. Equity rationing results when firms cannot raise external capital in equity markets. Imperfect information in equity markets generates moral hazard and adverse selection problems. An adverse selection problem takes place when the decision makers of firms (managers) have superior information from potential equity buyers. A decision to sell new equity indicates that, on average, the view of the manager of a firm is less optimistic compared to the new of the participants in equity markets. The announcement of issue new equity is very likely to cause a downward revaluation of the firm in the market, which in its turn will decrease the demand for firm's equities. Asymmetric information in equity markets is the reason therefore, which causes equity rationing and limits the choices of a firm to raise external funds in order to finance new investments. Credit rationing and equity rationing form the basis of a finance rationing, which reflects the failure of the capital markets and the failure of a market economy according to the new-Keynesians.

Capitalism is a monetary economy, and hence moral hazard and adverse selection problems form an uncertain structure of micro economic transactions influencing any process of decision-making. Uncertainty causes instability in the macroeconomic policy decision-making, because it makes the participants in the markets unsafe about their economic interests. Economic agents act on the basis of their economic interests and attempt to influence the policy-making in a way with which to maximise their economic benefits conditional to the information they have in an uncertain and risky economic environment. However, the economic interests of lenders and borrowers are not considered to be a fundamental determinant of their economic and political behaviour in the new-Keynesian macroeconomics. In this tradition the targets of the monetary policy are analysed on the basis of the informational asymmetries among the participants in the market without considering their power and economic interests and the way they are influence the monetary policy-making. Credit rationing models implicitly refer to the conflict of the economic interests between the banking sector and the business sector. However, this conflict is limited to the informational asymmetries ignoring distributional conflicts.

### **3. A General Post-Keynesian-Kaleckian Macroeconomic Process**

Power and conflict might play a significant role in banks and other financial institutions ability to influence the price and the availability of finance. The concept of power raises questions about its distribution among different social groups and sections, i.e. the business sector, the banking sector and must be considered conditional to the institutional structure of an economy. The connection between the industrial and the financial sector is a factor that to a large

extent forms the type of the relationship between the two sectors, whether it is cooperative or conflictual (Argitis, 2001). The institutional structure of an economy is therefore important in considerations regarding the availability of external finance from banks to industry and in the interest rate setting. Credit rationing is thus more probable in a conflictual institutional structure. The investigation of the role of such institutional, political and power factors in the way that finance and monetary policy might affect investment and accumulation is very important, since it accounts for national diversities in economic performance. We will attempt to theoretically outline the role of these factors within a general post-Keynesian framework.

The thrust of post-Keynesian macroeconomics is the centrality of aggregate demand in the determination of the level of economic activity. The aggregate consumption function incorporated a Kaleckian difference in the propensity to consume out of wage and profit income allows distribution to impact the level of aggregate demand. Power is considered to be crucial in defining the way income is distributed. On the other hand, investment is a function of the rate of capacity utilisation (Marglin and Bhauri, 1991) and firm's internal funds (Fazzari, 1993), which in turn depends on total profit realised. A fall in expected total profit and in expected internal funds generates finance constraints on investment spending. To understand these macro relations we shall first consider the role of debt in an economy with a conflictual relation between the industrial and the financial sectors.

Debt is a central financial feature of post-Keynesian macro-economics, and is conceptualised as a factor that influence investment and aggregate demand. Debt creates a complex set of relations between the industrial and the financial sector. The focus on debt derives from the seminal work developed by Minsky on financial instability and crisis. Minsky's central concern has been to develop an endogenous process of macro-instability. In his argumentation, systemic financial fragility and instability arise from the financial practices of the non-financial corporate sector. His inspiration is derived from Keynes's General Theory and Fisher's description of a debt deflation (Minsky, 1974).

According to Minsky (1977; 1982a; 1982b; 1986; 1992), the robustness or fragility of a financial system depends on two relations: the cash flow patterns of a financial system, and the way the functioning of a financial system affects the cash flow, which enable business, households and financial institutions to fulfil their financial commitments. The two sectors appear to have competing interests and both want to maximize their profits. Industry makes profit through investment and the accumulation process, while banks and other financial institutions through lending and other financial activities.

More specifically, in Minsky's approach macroeconomic instability cause by financial instability. The latter regards an initial robust financial system, which is transformed to a fragile financial system. Financial instability and crisis are very likely to occur as a result of an increasing fragility in the financial sector.<sup>3</sup> There are three fundamental determinants of this happening; when the corporate sector increases its reliance on debt to finance new investment; when economy's

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<sup>3</sup> *This is the case when some financial units can not refinance their position through the normal channels (credit markets) and are forced to raise cash by unconventional instruments or by trying to sell out their position to increase their liquidity (Minsky, 1986).*

liquidity falls and when finance becomes more speculative and *ponzi* (Minsky, 1977)<sup>4</sup>.

In case that the business sector finds profitable investment opportunities, especially during the economic upswing, demands more credit. The accumulation of debt increases the fragility of the corporate sector. At the peak of the business cycle, the demand for credit from the corporate sector is inelastic, but, on the other hand, the supply of credit is not perfectly elastic. The increasing demand for credit increases the power of the financial system, which influences the politics of the central bank and pushes the rate of interest up. As a result, the cash payment commitments of the corporate sector will increase relative to its cash receipts, while, simultaneously, the market value of the firm's assets will fall relative to its liabilities.

Minsky follows Kalecki and argues that corporate profits are determined by capitalist investment. On the other hand, Kalecki's (1971) argues the amount of capital owned by the firm, is of decisive importance in limiting investment and the size of a firm. Kalecki makes a distinction between the capital owned by the firm and the capital it tries to borrow. What is crucial in Kalecki's argument is the idea that a firm's access to the capital market is determined, among other factors, by the amount of its own capital. In other words, the external finance that industrial firms hope to obtain in the form of lending is determined by the amount of their internal finance. A firms' ability to grow thus depends directly on its internal finance generate by realised profits and indirectly through borrowing that depends on its internal finance.

In this framework, a tight monetary policy exerts a negative effect on investment and accumulation via two channels. First, it increases interest payments paid by the industrial sector and hence causes a distributional effect worsening the ratio of internal/external finance for the corporate sector, which increase its reliance on debt. Yet, investment decisions depend on a more expensive external finance. Secondly, in a Kaleckian manner, the availability of external finance to business sector falls because of the decrease in its internal funds. Consequently, investment is very likely to decrease. In this perspective, the interest rate does not work through the cost of capital effect, but through the distributional effect. A fall in investment reduces business profits and makes firms

<sup>4</sup> According to Minsky (1977), in a modern capitalist economy economic units control a structure of capital assets that yield cash flows over time, which depends on the demand for output produced by these capital assets and the output price. Combinations of debt and equity constructing a structure of firm's liabilities and firm's gross profits finance such capital assets. At any point in time the liability structure determines a time series of payments. The cash flow problem for a unit concerns the balancing between the cash receipts from operations and the cash payments due to debts. If the expected cash receipts exceed the cash payment commitments during a period of time, then, a unit is a hedge unit. If the unit can meet the payment commitments on liabilities, which represent only interest, but not all its payment commitments over the same period, is a speculative financing unit. A ponzi financing unit is a speculative unit for which the interest of its payment commitments exceeds the net income receipts. The continuation of the functioning of a ponzi financing unit depends on its ability to borrow money. Both ponzi and speculative units are vulnerable to changes in the financial markets and changes in the rate of interest. Financial constraints and higher interest rates raises the fragility of the financial system and lead ponzi and speculative units to bankruptcy.



unable to meet their interest payments for their debt generating possibilities of financial instability and crisis. Financial instability is transforming to the business sector. The stance of the monetary policy appears, therefore, to be a crucial determinant of the finance-investment relation and the macro-behaviour of an economy. Minsky in all his work strongly proposes that the central bank must act as a lender of last resort; to implement expansionary policies in order to relax tensions in financial markets and to avoid a financial and macro instability.

Business profits are also affected by the distribution of income between entrepreneurs and workers. Income redistribution at the expense of workers minimise the distributional effects of monetary policy and increases the internal finance for the business sector. However, such a change is likely to have a negative demand effect.

Concluding, this general post-Keynesian perspective considers power and conflict in the investigation of the finance-investment relation. Finance is allowed to be factor that influences the politics of the central bank and the monetary policy-making. High interest rates increase the interest payments paid by industry and reduce the available internal funds for the business sector to finance investment. This type of finance-investment relation presupposes a conflicting relation between the industrial and the financial system. Only in such an institutional structure finance is likely to cause distributional and demand effects and macro-instability. This is the case of the economic structures of the UK and the USA. The post-Keynesian perspective, in contradistinction with the neo-classical and the new-Keynesian, allows for the multiplicity of capitalist institutions, structures and practices in today's world.

#### **4. Empirical Analysis**

The last two decades or so, the globalisation of finance has lead to the creation of a new macroeconomic policy-structure. Unprecedented high interest rates and a deflationary obsession in macro-policy have been major features of developed and developing countries. In this section we use the post-Keynesian perspective developed previously and attempt to investigate whether these policy changes have influenced the financial structure of firms, their investment decision-making and the macro-systems of nations.

Figures 1 and 2 exhibit the way changes in data patterns have occurred concerning real interest payments paid by non-financial corporations (NFCs) in the USA and the UK during the period 1963-2002. We observe an upward trend of real interest payments since the late 1970's, which became sharper during the 1980s, when high real interest rates consolidated. After 1991 real interest payments show a downward movement, but from the mid-1990s this trend has been reversed. However the interest paid by the NFCs is very much above the level reached in the 1960's and 1970's.

Figures 3 and 4 exhibit the real interest payments as a percentage of the total business profit. This ration also reveals changes in the internal funds available to the business sector to finance investment plans. We observe that in the USA there is an internal finance squeeze up to the 1990. During the 1990s the business sector achieved to reduce its interest payments and to recover internal profits, however this developed reversed in the second half of the 1990s. In the

UK the non-financial corporate sector has experienced less severe reductions in its available internal funds. There is an upward trend in the interest payments, which reveals that internal funds have been under a systematic pressure due to the redistribution effects of the accumulated debt and the deflationary bias of the monetary policy. But to what extent these financial developments influence investment expenditures?

#### 4.1. An Econometric Investigation

The investment function has been the subject of a large number of econometric studies, which have provided very important evidence with significant implications for theory and policy. In this paper we develop an investment equation, inspired by the post-Keynesian perspective, in an attempt to empirically assess new channels through which finance might influence investment.

Equation 1 formalizes our main hypotheses:

$$\text{GCS} = f(\text{FINPS}, \text{CU}, \text{WSS}) \quad (1)$$

The growth rate of business capital stock, GCS, is our dependent variable. The expansion of the capital stock captures both the materialization of new investment and the dynamics of the investment decision-making. The variable FINPS, is the interest payments as a percentage of total business profit. We select this variable because it reflects the distributional impact of finance and of monetary policy on business internal funds. The idea lies on the Minskian negative relation between cash payments and investment. A rise in the financial profit share normally reflects higher interest payments and less available internal funds<sup>5</sup> for firms to finance new investment as well as pessimistic expectations about future profits and profitability. Furthermore, this variable also captures the politics of the central bank and the distributional impacts of the stance of monetary policy.

Within a post-Keynesian framework, investment is also affected by changes in aggregate demand. The standard accelerator hypothesis underpins this relation. The best way of incorporating this effect into an empirical investment equation would be to include a capacity utilisation variable, as a proxy of the aggregate demand. This variable has been extensively used in many econometrically estimated investment models.

Our last explanatory variable is the labour income share, WSS. According to the post-Keynesian perspective developed previously, an increase in business profit share reduces the negative distributional effect of finance on internal funds. Industry by redistributing wage income counterbalance the rise in interest payments paid to the financial sector. We use the WSS to capture this effect and to avoid misspecification problems in our econometric model raised by correlated

<sup>5</sup> The issue of the causation between internal funds and investment has been addressed by other empirical works (e.g. Fazzari and Mott, 1986-87; Fazzari et al., 1988; Fazzari, 1993; van Ees et al., 1997).

variables. Furthermore, the use of the WSS variable allows to capture the impact that workers' power might have on wage-setting and on income distribution.

Assuming a linear function and a stochastic relationship, equation 1 including the error term results in the following specification of our estimating equation:

$$GCS_t = a + bFINPS_t + cCU_t + dWSS_t + ut \quad (2)$$

The expected signs being:  $f_{FINPS} < 0$ ;  $f_{CU} > 0$ ;  $f_{WSS} < 0$

Full definitions and sources of all the variables are given in the Appendix. Note that in our specification many variables are defined in growth rates (GCS) or ratios (FINPS, WSS) and hence are non-trended. An investigation of the data pattern shows that CU is also a non-trended variable. Following the literature, an autoregressive distributed lag (ARDL) structure of equation 2 is tested using annual data.<sup>6</sup> We abstain from including other country specific variables and we examine the sensitivity of the results to changes in the time series specification. The Akaike Information and the Schwarz Bayesian criteria suggest that a lag structure of the model up to the second order is preferred by the Data.

### Regression results

We regard the ARDL (2,2,2,2,2) model as a starting point and attempt to optimise the fit for each country by narrowing down the number of parameters, taking the t-value as an indicator. The information we wish to extract from the ARDL model is whether the variables should be included in levels, in differences and in lags. Table 1 presents the estimated regressions preferred by the data.

After the application of a full range of misspecification tests in the estimated regression, which are reported in Table 2, we fail to reject the null hypothesis. Therefore, there is no evidence of serial correlation, or of a rejection of the linearity, normality, homoskedasticity assumptions at the 5% and 10% level of significance by the standard Lagrange Multiplier test. Moreover, the CUSUM and CUSUMSQ tests provide no evidence of structural instability in any of the reported regressions. The coefficient of determination,  $R^2$ , which is .87 for the USA indicates a good fitness of our estimated regressions. The insignificance of CU in the UK reduces the value of  $R^2$  to .59.

The estimates reveal that the first lagged value of the dependent variable has a positive and significant influence on the current value of the growth rate of capital stock. The statistical significance of the lagged dependent variable shows the autoregressive nature of investment. The financial profit share appeared to be an important determinant of investment. The results show that in both countries it is statistically significant at the 5% level and has the expected negative sign. An increase in the interest payments reduces the internal funds for the business sector and discourages investment. The share of financial profits to total profits emerges therefore, as a channel through which finance and monetary policy affects investment and industrial accumulation. Durable changes in the interest rate and

<sup>6</sup> ARDL models have been shown to have desirable properties even in the face of unit roots (Pesaran and Shin, 1995).

the implementation of a restrictive monetary policy act as a potent source of internal financial constraints on investment. The opposite distributional and financial effects will occur if monetary policy is expansionary.

Turning to the other explanatory variables, we see that the coefficients have the expected signs and are statistically significant, but the CU in the UK. The change of capacity utilization appears to exert a significant positive impact on the growth rate of capital stock. Macro-policies that stimulate demand will have a strong, positive impact on investment. Income redistribution towards workers exerts a negative impact on investment as it is expected. This variable, to the extent that it captures class power, reveals that shifts in the distribution of power are a determinant of investment decisions. Changes in the cost of labour influences negatively investment decisions.

## **5. Conclusions**

The results presented here demonstrate that finance, demand and income distribution influences investment. Lower business profits and higher interest payments reduce internal cash flows and thus weaken investment. In addition, lower sales reduce the need to expand industry's capacity.

The indebted firms and industries are likely that first meet investment problems, when monetary policy becomes more restrictive. The distributional consequences of monetary policy and external financial bottlenecks stimulate changes in the production process and in firms' ability to fulfil their repayment commitments and thus increase the possibility of a Minskian financial instability and crisis. If we really wish a productive investment recovery, more employment, macroeconomic and financial stability, it is necessary that an immediate change in macroeconomic policies must take place towards an expansionary policy regime.

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### *Appendix*

#### *Data: Definitions and Sources*

FIPS =  $GTP - INP / GTP$ : GTP= Gross Trading Profits of the non-financial corporate sector before providing for depreciation and stock appreciation, and before taxes, INP= Interest Payments, Survey of Current Business, US Department of Commerce (USA), Blue Book, National Accounts (UK).

WS=Wages paid by the non-financial corporate sector. Source the same as above.

$WSS = WS / (WS + GTP)$ .

CU= Capacity Utilization, Main Economic Indicators, OECD.

GCS= Business Capital Stock, OECD, National Accounts.

Table 1 Regression Results

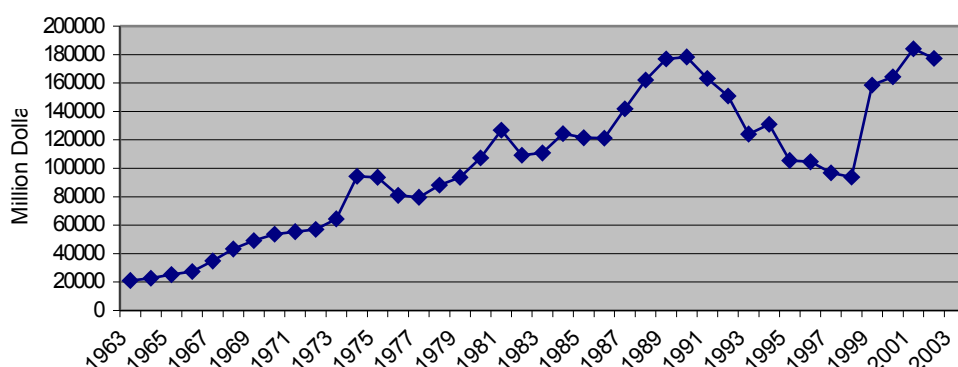
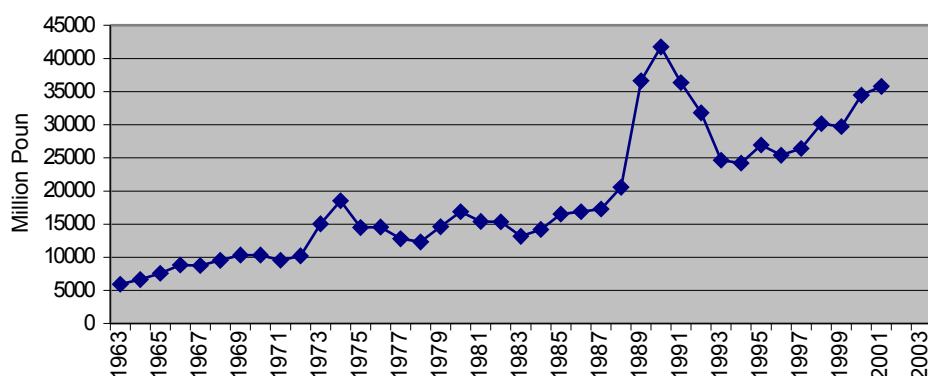
Period	Country	
1970-02	USA	$GCS = -.033 + .66GCS(-1) - .0006FIPS + .0028DCU - .004WSS$
	$R^2 = .87$	<i>-3.4      6.9      -2.58      4.78      -3.38</i>
1970-02	UK	$GCS = .43 + .40GCS(-1) - .29FIPS - .37WSS$
	$R^2 = .59$	<i>2.15      2.08      -2.34      -2.12</i>

Notes: Italic numbers are t-values

**Table 2. Diagnostic Tests**

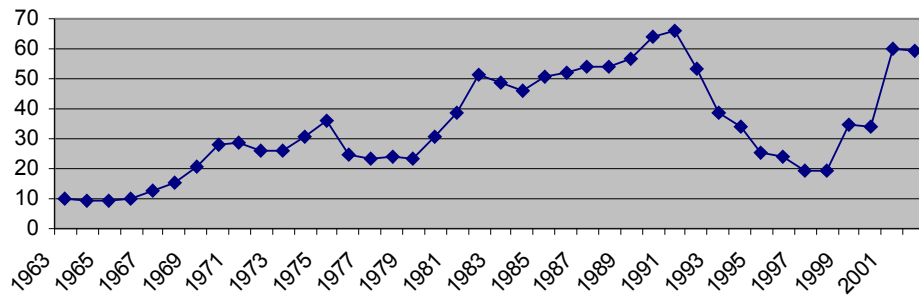
Test Statistics	LM Version	
	USA	UK
Serial Correlation	CHI-SQ(1)=.39	CHI-SQ(1)=1.36
Functional Form	CHI-SQ(1)=.062	CHI-SQ(1)=3.89
Normality	CHI-SQ(2)=.21	CHI-SQ(2)=2.13
Heteroscedasticity	CHI-SQ(1)=.34	CHI-SQ(1)=2.69

Notes: Critical values for CHI-SQ (1) and CHI-SQ (2) at 5% and CHI-SQ (1) at 1% level of significance are 3.84, 5.99 and 6.63 respectively.

**Figure 1. Real Interest Payments, NFCS, USA****Figure 2. Real Interest Payments, NFCS, UK**



**Figure 3. Real Interest Payments as a % of Total Business Profit, NFCS, USA**



**Figure 4. Real Interest Payments as % of Total Business Profit, NFCS, UK**

